

Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Shibboleth Creek

Waterbody Segment at a Glance:

County: Washington
Nearby Cities: Shibboleth
Length of impairment: 0.5 miles
Pollutant: Nonvolatile Suspended Solids (NVSS)
Source: Barite Tailings Pond



State map showing location of watershed

TMDL Priority Ranking: Low

Description of the Problem

Beneficial uses of Shibboleth Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

Standards for Nonvolatile Suspended Solids are found in the general criteria section of the WQS, 10 CSR 20-7.031(3)(A), (C) and (G) where it states:

- Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses
- Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.
- Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.

Background Information and Water Quality Data

Non-Volatile Suspended Solids (NVSS) are mineral solids (like silt, sand or gravel) that are associated with soil erosion or erosion of mine-waste materials or stockpiles. When these solids get into a stream, they settle onto the bottom and smother natural substrates (materials in the streambed), aquatic invertebrate animals and fish eggs.

Barite, or barium sulfate, is mined in many areas of southern and eastern Washington County and southwestern Jefferson County. Also known as “tiff”, barite is a mineral used in well-drilling mud, chemical manufacture, fillers and extenders, face powders, chocolate coatings, glass making, with X-rays and in paint. The first step in processing barite is to wash the mined material to separate the barite ore from the red clay and gravel found with it. The separated clay and gravel are discharged to barite tailings ponds and allowed to settle out. Overflows of water from these tailings ponds can contain suspended clay material that subsequently is deposited in the bottom of receiving streams.

The deposited red clays constitute the NVSS that impair Shibboleth Creek (also called Shibboleth Branch). Visual inspections of this stream have been conducted immediately downstream of an inactive barite settling pond. For several years, inspections of this stream have shown an excessive amount of clay fines are being deposited in the stream. In October 2002, the department conducted a qualitative examination of the aquatic invertebrate benthic community of this stream, one other stream with an inactive barite tailings pond, one with an active tailings pond and one stream without a barite tailings pond which was used as a control. The results of this survey are summarized in the table below.

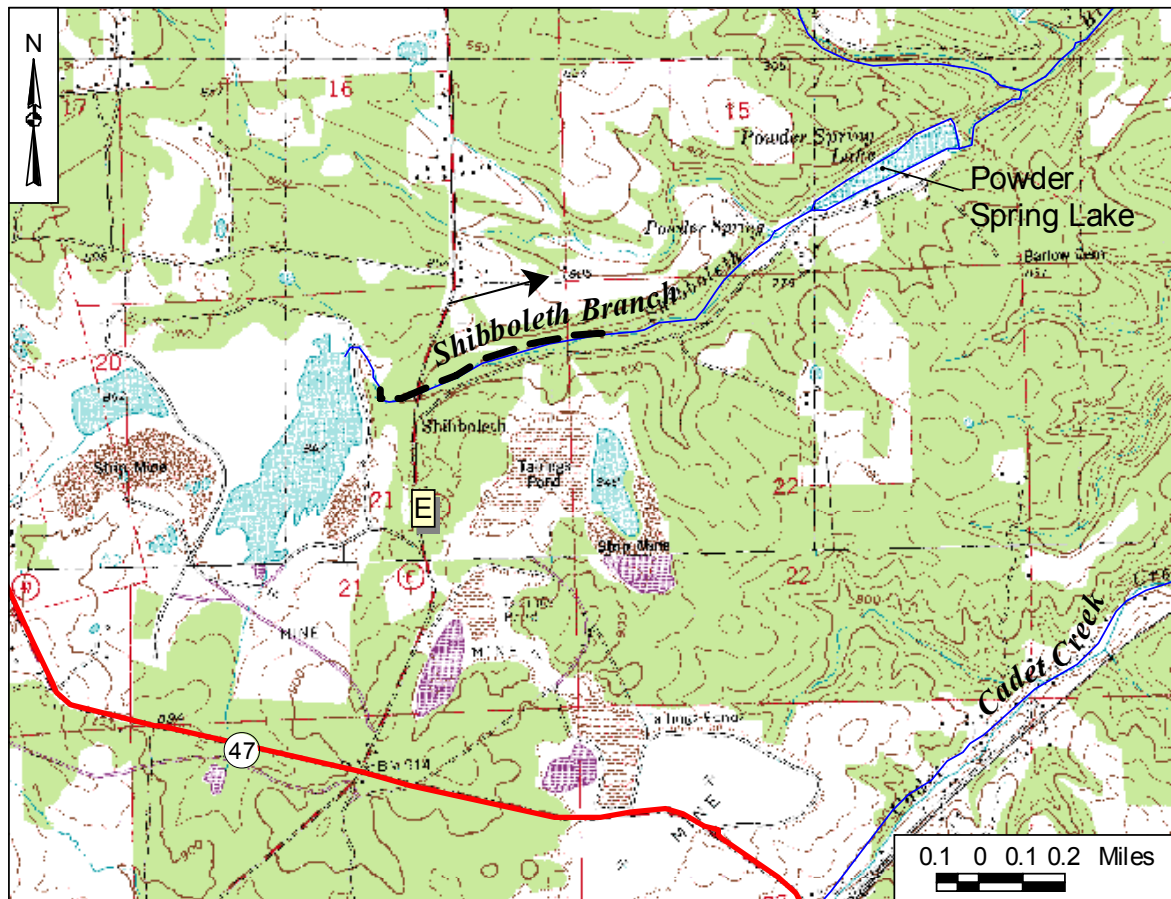
Table 1. Summary of Qualitative Aquatic Invertebrate Sampling of Four Streams in Washington County, October 2002		
Stream	Total Number of Taxa	Total Number of EPT* Taxa
Tributary to Pond Creek – active tailings pond	23	7
Tributary to Mineral Fork - inactive tailings pond	20	6
Rubeneau Creek – control	16	6
Shibboleth Branch - inactive tailings pond	17	5

* EPT= Ephemeroptera, Plecoptera and Trichoptera (Mayflies, Stoneflies and Caddisflies). These taxa are very sensitive to pollution. The presence or absence of these groups is an indicator of the state of health of a stream.

Shibboleth Creek had the lowest number of EPT taxa and the next to lowest number of total taxa. For reference (high quality) streams in this area of the state, the number of EPT taxa in the 25th percentile is eight. These reference streams are larger in size than the four streams noted above, and other things being equal, should have more taxa because of their larger size.

A map of the area is on the next page.

Map of Impaired Segment of Shibboleth Creek in Washington County, Missouri



--- Impaired Segment

→ Direction of Flow

For more information call or write:

Missouri Department of Natural Resources

Water Protection Program

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